

CLAIMS

1. An antenna comprising:

a thin plate-like base member (3) made of dielectric material;

5 a ground conductor (5) formed of a thin-film shaped and rectangular conductor
and disposed on the base member (3);

a first antenna element (7) formed of a thin-film shaped and L-shaped conductor,
having one end connected to one end of the ground conductor (5) and disposed on the
base member (3); and

10 a second antenna element (9) formed of a thin-film shaped and rectangular
conductor and disposed on the base member (3) without being directly connected to
the ground conductor (5) and the first antenna element (7).

2. The antenna according to claim 1, wherein a first resonance is generated by

15 electric current distributed on the first antenna element (7) and a second resonance is
generated by electric current distributed on the second antenna element (9).

3. The antenna according to claim 1, wherein the ground conductor (5), the first
antenna element (7) and the second antenna element (9) are disposed on one surface of
20 the base member (3).

4. The antenna according to claim 3, wherein a slit portion (6) opening at a part
thereof is formed on the base member (3) by combining the ground conductor (5) and
the first antenna element (7) and the second antenna element (9) is disposed in the slit

25 portion (6).

5. The antenna according to claim 1, further comprising:

a first connecting portion (7C) formed on the first antenna element (7) in order to electrically connect the first antenna element (7) to a first conductor (13) of a cable (11);

5 a contact portion (9A) formed on the second antenna element (9) in order to electrically connect the second antenna element (9) to a second conductor (17) of the cable (11) via dielectric member (18); and

10 a second connecting portion (5B) formed on the ground conductor (5) in order to electrically connect the ground conductor (5) to the second conductor (17) of the cable (11).

6. The antenna according to claim 5, wherein a thin insulation layer (40) is covered over surfaces of the first antenna element (7) except for the first connecting portion

15 (7C), the second antenna element (9) and the ground conductor (5) except for the second connecting portion (5B).

7. The antenna according to claim 5, wherein the cable (11), the first conductor (13),

the second conductor (17) and the dielectric member (18) are a coaxial cable, an inner conductor of the coaxial cable, an outer conductor of the coaxial cable and a sheath of the coaxial cable, respectively.

8. The antenna according to claim 7, wherein a film-like dielectric member is disposed between the contact portion (9A) and the sheath of the coaxial cable.

25 9. The antenna according to claim 1, wherein the base member (3) has flexibility.

10. The antenna according to claim 9, wherein the ground conductor (5), the first antenna element (7) and the second antenna element (9) have flexibilities.

11. The antenna according to claim 10, further comprising:

5 a support member (33) made of non-conductor and fixedly securing the base member (3).

12. The antenna according to claim 11, wherein the support member (33) comprises:

10 an upper end portion (35) extending to one direction;
a lower end portion (39) disposed in parallel to the upper end portion (35); and
an interconnecting portion (37) having one end vertically connected to one end (35B) of the upper end portion (35) and the other end vertically connected to one end (39B) of the lower end portion (39).

15 13. The antenna according to claim 1, wherein the base member (3) is mounted on an LCD section (20) of a notebook-sized PC (19).

14. The antenna according to claim 1, wherein the base member (3) is mounted on a corner area of a casing (21) of a notebook-sized PC (19).

20 15. The antenna according to claim 1, wherein the ground conductor (5), the first antenna element (7) and the second antenna element (9) are formed on the base member (3) by means of at least one of an etching technique and a screen printing technique.

25

16. An antenna comprising:

a thin plate-like base member (43) made of dielectric material;
a first antenna element (45) formed of a thin-film shaped conductor and
disposed on the base member (43) so as to form a slit portion (46) opening at a part
thereof;

5 a second antenna element (47) formed of a thin-film and strip shaped
conductor and disposed in the slit portion (46); and

10 an impedance adjustment element (49) formed of a thin-film and strip shaped
conductor and disposed between one side (45B) of the first antenna element (45) and
the second antenna element (47) in the slit portion (46).

15 17. The antenna according to claim 16, wherein a first resonance is generated by
electric current distributed on the first antenna element (45), a second resonance is
generated by electric current distributed on the second antenna element (47) and
the impedance is adjusted corresponding to a shape and arrangement location of the
impedance adjustment element (49).

18. The antenna according to claim 16, wherein the first antenna element (45), the
second antenna element (47) and the impedance adjustment element (49) are disposed
on one surface of the base member (43).

20 19. The antenna according to claim 18, wherein
the first antenna element (45) comprises:
a first radiating portion (45A) formed in a strip shape;
a second radiating portion (45B) formed in a strip shape and disposed
25 in parallel to the first radiating portion (45A); and
an interconnecting portion (45C) having one end vertically connected

to one end (45E) of the first radiating portion (45A) and the other end vertically connected to one end (45D) of the second radiating portion (45B),

the second antenna element (47) is disposed between the first radiating portion (45A) and the second radiating portion (45B) and in parallel to the first radiating portion (45A), and

5 the impedance adjustment element (49) disposed between the second radiating portion (45B) and the second antenna element (47) and in parallel to the second radiating portion (45B).

10 20. The antenna according to claim 19, wherein the first radiating portion (45A) is longer than the second antenna element (47) and the second antenna element (47) is longer than the second radiating portion (45B) and the impedance adjustment element (49).

15 21. The antenna according to claim 16, further comprising:

a first connecting portion (51) formed on the second radiating portion (45B) in order to electrically connect the second radiating portion (45B) of the first antenna element (45) to a first conductor (13) of a cable;

20 a first contact portion (53) formed on the impedance adjustment element (49) in order to contact the impedance adjustment element (49) to the first conductor (13) of the cable (11) covered with a covering material (15);

a second connecting portion (55) formed on the second antenna element (47) in order to electrically connect the second antenna element (47) to a second conductor (17) of the cable (11); and

25 a second contact portion (57) formed on the first radiating portion (45A) in order to contact the first radiating portion (45A) of the first antenna element (45) to

the second conductor (17) of the cable (11) via a dielectric member (18).

22. The antenna according to claim 21, wherein a thin insulation layer (59) is
covered over surfaces of the first antenna element (45) except for the first connecting
portion (51), the second antenna element (47) except for the second connecting
portion (55) and the impedance adjustment element (49).
5

23. The antenna according to claim 21, wherein the cable (11), the first conductor
(13) and the second conductor (17) are a coaxial cable, an inner conductor of the
coaxial cable and an outer conductor of the coaxial cable, respectively.
10

24. The antenna according to claim 16, wherein the base member (43) has
flexibility.

15 25. The antenna according to claim 24, wherein the first antenna element (45), the
second antenna element (47) and the impedance adjustment element (49) have
flexibilities.

26. The antenna according to claim 10, further comprising:
20 a support member (33) made of non-conductor and fixedly securing the base
member (43).

27. The antenna according to claim 26, wherein the support member (33) comprises:
25 an upper end portion (35) extending to one direction;
a lower end portion (39) disposed in parallel to the upper end portion (35); and
an interconnecting portion (37) having one end vertically connected to one end

(35B) of the upper end portion (35) and the other end vertically connected to one end
(39B) of the lower end portion (39).

28. The antenna according to claim 16, wherein the base member (43) is mounted on
5 an LCD section (20) of a notebook-sized PC (19).

29. The antenna according to claim 16, wherein the base member (43) is mounted on
a corner area of a casing (21) of a notebook-sized PC (19).

10 30. The antenna according to claim 16, wherein the first antenna element (45), the
second antenna element (47) and the impedance adjustment element (49) are formed
on the base member by means of at least one of an etching technique and a screen
printing technique.

15 31. An antenna comprising:
a thin plate-like base member (43) made of dielectric material;
a first antenna element (45) formed of a thin-film shaped conductor and
disposed on the base member (43) so as to form a slit portion (46) opening at a part
thereof; and
20 a second antenna element (47) formed of a thin-film and strip shaped
conductor and disposed in the slit portion (46).

25 32. The antenna according to claim 31, further comprising:
a first rear surface antenna element (89) formed of a thin-film shaped
conductor and disposed on the other surface of the base member (83) so as to form a
rear surface slit portion opening at a part thereof; and

a second rear surface antenna element (91) formed of a thin-film and strip shaped conductor, disposed in the rear surface slit portion and electrically connected to the second antenna element (47, 87).

5 33. The antenna according to claim 32, wherein
the first rear surface antenna element (89) comprises:
a first rear surface radiating portion formed in a slip-shape;
a second rear surface radiating portion formed in a slip-shape and
disposed in parallel to the first rear surface radiating portion; and
10 a rear surface interconnecting portion connecting one end of the first
rear surface radiating portion and one end of the second rear surface radiating portion,
and
15 the second rear surface antenna element (91) is disposed between the first rear
surface radiating portion and the second rear surface radiating portion and in parallel
to the first rear surface radiating portion.